

learn about the current excitement in surface science would be better served by such other sources.

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The Physics of Solar Cells

Jenny Nelson

Imperial College Press, London,

2003. \$82.00, \$46.00 paper

(363 pp.). ISBN 1-86094-340-3,

ISBN 1-86094-349-7 paper

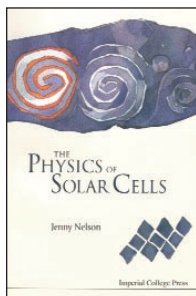
Third Generation Photovoltaics: Advanced Solar Energy Conversion

Martin A. Green

Springer-Verlag, New York, 2003.

\$109.00 (160 pp.).

ISBN 3-540-40137-7

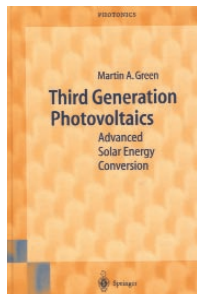


As events in Iraq remind us, securing energy supplies in a safe, environmentally sound, and economically viable fashion is one of the great challenges facing science and technology. *The Physics of Solar Cells* by

Jenny Nelson and *Third Generation Photovoltaics: Advanced Solar Energy Conversion* by Martin A. Green address the significant problems of photovoltaic energy conversion—and both books are useful.

The two books focus on theory and modeling. Nelson's book contains substantially more detail (it is twice as long), and most of the topics are explained quite clearly. Green's book is unified and challenging; it focuses particularly on different schemes for establishing and optimizing the efficiency of cells and largely follows Green's own research work.

The books have substantial positive similarities. For example, both provide solutions to exercises in the text and both offer a useful overview of the current state of photovoltaic conversion. The books also enjoy the unity that comes from having a single author, which is very rare in the field.



Most publications about photovoltaics tend to be edited conference proceedings and thus offer different notations and different approaches; the unified format is much more useful and readable.

But Nelson's and Green's books also share some failings. Neither was carefully proofread, so errors abound in each. In particular, equations are often referred to by the incorrect number, which makes it quite difficult for the nonexpert to follow the discussions. The books also contain errors in figure references, and each book uses incorrect symbols in several equations. All of the errors just mentioned could have been avoided by better proofreading. Both texts are published by distin-

guished presses, and I was distressed by such unnecessary hindrances in what are really very fine books. Another issue is that the books do not cover in detail two currently important themes in photovoltaics: The use of molecular species (as in the Graetzel solar cells, for example) and quantum dots.

The great strengths of the Green book are its sharp focus on efficiencies of different processes, its unified mathematical notation, its extensive cross-referencing between chapters, and its delving into some very advanced concepts that are still largely unexplored. The Nelson book is more encyclopedic, with clear figures and broad scope. It also does a better job of

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clarifying the fundamental issues and is a less advanced text. It is, therefore, probably more approachable and more useful to the general reader.

Nelson's introductory text and Green's more focused and advanced book complement each other nicely. Together, they provide a nice overview (with a gap or two) of the current state of photovoltaics for energy conversion.

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New Books

Energy and Environment

Acid Rain Science and Politics in Japan: A History of Knowledge and Action Toward Sustainability. K. E. Wilkening. *Politics, Science, and the Environment*. MIT Press, Cambridge, MA, 2004. \$62.00, \$19.00 *paper* (322 pp.). ISBN 0-262-23235-9, ISBN 0-262-73166-5 *paper*

Fluids

Slow Dynamics in Complex Systems. M. Tokuyama, I. Oppenheim, eds. *AIP Conference Proceedings 708*. Proc. symp., Sendai, Japan, Nov. 2003. AIP, Melville, NY, 2004. \$210.00 (829 pp.). ISBN 0-7354-0183-7

Geophysics

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American Genesis: A Century of Invention and Technological Enthusiasm, 1870-1970. T. P. Hughes. U. of Chicago Press, Chicago, 2004 [1989, reissued]. \$22.50 *paper* (529 pp.). ISBN 0-226-35927-1

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